

HARRIS (ROBT, P.)

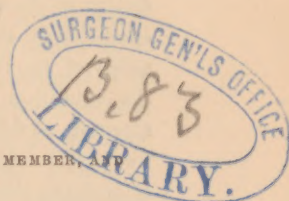
A study and analysis
of one hundred Cæsarean
operations x x x x x



A STUDY AND ANALYSIS OF ONE HUNDRED CÆSAREAN OPERATIONS
PERFORMED IN THE UNITED STATES, DURING THE PRESENT
CENTURY, AND PRIOR TO THE YEAR 1878.

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By ROBERT P. HARRIS, A.M., M.D.,
OF PHILADELPHIA,

MEMBER OF THE AM. PHILOS. SOC., FELLOW OF THE COLL. OF PHYS., MEMBER, AND
FORMERLY PRES. PHIL. OBSTETRICAL SOC., ETC.



AFTER a search of nearly ten years, with several interruptions, I have so far completed my statistical work, as to be able to draw from it several valuable lessons for the guidance of future operators, who may be willing to receive instructions from the successes and failures of their predecessors, and anxious to improve upon their work for the good of suffering humanity. I have limited my remarks to one hundred cases, although there are a few in excess of it, in order that all the calculations of percentage may be in correspondence with any proportionate number given; five cases representing five per cent., twenty, twenty per cent., etc., the one hundred operations being in the order of their occurrence.

Statistical medical work, to be of value, must not only be thorough and complete, but be separated from the dry detail of tables, and made to appear rather as a commentary upon them, after they shall have been carefully arranged for reference, than as a part of them. I have already given much in the form of abridged reports and tabular records; but, for the balance of cases, shall content myself with a statement of facts derived from them. The collected record of all the cases will be preserved in book form, and eventually become the property of the Library of the College of Physicians of Philadelphia. I have been particularly careful to obtain, as nearly as possible, all the published and unpublished records of the Cæsarean operation in this country; and have so far succeeded, through a persevering correspondence, as to increase the printed record by 43 per cent. By doing this I have largely augmented the list of fatal cases, but at the same time have greatly improved our knowledge of the causes which have led to the fatality of the operation; a result which I regret to find has been frightfully on the increase in the operations undertaken during the last decade.

In studying the record collected, I find it highly important to separate the operation from its results; crediting the operator, only with what he

is legitimately chargeable, and resting the balance of the risk upon the delays, errors, etc., to which it properly belongs. The operation of gastro-hysterotomy is a dangerous one in itself, but by no means so much so as our statistics would upon a superficial examination make it appear. We have therefore three important points to consider: 1. What is the real danger of the operation, when performed with a due regard to the physical condition of the patient; the time she should spend in labour; and the safety of the fœtus? 2. How much of the recorded mortality is due to the condition of the woman at the time of the operation; the futile attempts at delivery through an impassable pelvis; and the time wasted by delay? And, 3. What amount of fatality is directly due to the danger of incising the uterus of an exhausted woman; the said organ having by its own muscular activity become materially changed in character, as shown in some instances, by an altered colour or density, or a total loss of the power to contract, when emptied of its contents?

Muscular activity, under the power of the will in our voluntary muscles, first produces a swelling of the parts by the increased determination of blood to them; then a sensation of fatigue, which becomes painful if long excited; and secondarily after rest, a sore, contused sensation in the muscles used, when again brought into action. In the involuntary muscles of the uterus, there would appear to be a progressive change, ending in a loss of contractile force, if not of destruction of tissue. In some Cæsarean operations the uterus has been found much thickened; in others of a chocolate colour; and in others in a condition approaching decomposition of substance. What changes ordinarily take place in the uterus during long labour can only be determined by a series of microscopical observations in subjects difficult of access; but whatever they may be, I am confident that they have much to do with the danger so markedly increased by delay in operating. It is a mistake to suppose that the great danger is in opening the abdominal cavity. This is done in a variety of surgical operations where the fatality is comparatively moderate; why then should it be so much more dangerous in a pregnant woman? Ovariectomy may be performed safely where there is a fœtus in utero; and a large proportion of laparotomy cases after ruptured uterus recover; where then is the danger in long delay in the Cæsarean operation, unless it be from the increase of risk in wounding a uterus changed by long activity, in an exhausted subject? The bearing of this view will be seen to advantage, when we come to examine our record of operations upon dwarfed subjects.

The condition of the woman to be operated upon, is to be considered in two aspects: 1st. What was it prior to the commencement of labour? And 2d. What is it at the time the operation is entered upon? The case may have been rendered unfavourable by previous disease, dwarfing or deforming the body; or by some present malady of more recent date; or be made much more serious than it otherwise might have been, by

reason of futile attempts at delivery, or unnecessary delay on the part of a midwife, the accoucheur, or the surgeon himself, although we are glad to find that the last has rarely been chargeable with any uncalled-for postponement in our country, after having been called in to operate.

Dwarfed Subjects.—Of these we record nineteen. Sixteen cases were the result of rickets in childhood; one had an exostosis of the sacrum; another had lordosis and ankylosis, with the right thigh nearly at a right angle with the pelvis; and the remaining one was a member of a family of dwarfs. These varied in height from 3 feet to 4 feet 8 inches, and in weight from 65 to 115 pounds; and will readily be believed to have been unfavourable subjects for so severe an operation. If nearly one-fifth of this class of operations is to be performed upon women who have been rendered diminutive and feeble by rickets, then how important is it that their little strength should not be wasted by delay, or their cases made almost necessarily fatal, by craniotomy, version, or other futile efforts at delivery. It cannot be a very difficult matter to determine the amount of pelvic contraction in these cases, at least with sufficient accuracy to decide, whether or not the Cæsarean section will be found a matter of necessity; or of a wise election, as compared with craniotomy, embryotomy, and cephalotripsy. If, according to the investigations of Parry, whose decision I have verified by my own researches, it be correct, that craniotomy has scarcely a fractional advantage in saving life, over gastro-hysterotomy, in cases where the conjugate diameter of the superior strait measures $2\frac{1}{2}$ inches or less; and not even this claim, when the latter is performed as it should be, very early in labour; then it becomes all important to make an early decision before the powers of the patient have been wasted, the fœtus perhaps lost or destroyed, and the case unfitted for the knife.

That a dwarf even of very diminutive stature may endure the abdominal section with success, we have in proof, by the report of the case of Ernestine Leher, of Brest, France, operated upon by Dr. J. Cerf. Mayer, on May 30, 1874. This rachitic subject measured but 91 centimetres, or $35\frac{7}{10}$ inches in height, and yet her life and that of her son Cæsar were saved by an early operation, she having been in labour but a few hours. Labour commenced in the morning; Drs. Mayer and Delattre were called in at $1\frac{1}{2}$ P.M.; found the conjugate $1\frac{6}{10}$ inches; summoned other consultants who confirmed their decision to operate, and the section was made at 3 P.M. (*Archives de Tocologie*, Paris, 1874, page 513). This commendable promptness of Dr. Mayer and his associates might well be imitated to advantage in our own country.

The conjugate diameter has been noted in 14 of the 19 dwarfs, and in only one instance did it exceed 2 inches, and in 10 of the 14, it varied from $\frac{5}{8}$ of an inch to $1\frac{3}{4}$. One would suppose very naturally, that under these circumstances it would be an easy matter to decide early, as to the

necessity for the use of the knife; but what are the facts? By a careful examination, we can only rate 7 of the 18 operations as *timely*, and these saved 5 women and 5 children, all the seven children being alive when delivered but one. There were 8 women operated upon within 24 hours from the commencement of labour, all of whom recovered but 3, and 6 children were saved. The 3 women who died were all exceedingly small, viz., No. 5, was 3 ft. 6, white, conjugate $1\frac{3}{4}$, in labour 16 to 18 hours, but much exhausted before the operation. Her child was of full size, and lived; she died of peritonitis on the second day. No. 14, 3 ft. $6\frac{1}{2}$, white, conjugate $\frac{5}{8}$, a cripple and on crutches from early childhood, in labour 8 or 9 hours, died of exhaustion, escape of lochia into the peritoneal cavity, and commencing peritonitis in 20 hours. No. 19, 3 ft. 4, white, 65 pounds in weight, conjugate 2 inches; "operation early," woman died of peritonitis and degeneration of uterine tissue, in 5 days; child weighed 6 pounds, 20 inches long, and lived.

Eleven dwarfs were operated upon, on the second, third, and fourth days of labour, viz., 4 on the second day, one woman and two children saved; 3 on the third, one child saved; and 3 on the fourth, with one child saved.

In view of the fact that *but one dwarf was saved out of 11 who were operated upon, after the first day of labour*, it will be profitable to examine into the causes which led to so unfavourable a result as compared with that of the operations performed at an earlier period. I number the cases in the order of their occurrence, simply as a matter of convenient reference.

No. 2, white, 4 ft. 1, conjugate diameter $1\frac{3}{4}$, was $3\frac{1}{2}$ days in labour, under care of a midwife; child dead, woman under febrile excitement before operation; died in 4 days of *peritonitis*. No. 6, white, in labour 30 hours, and much exhausted; woman died of *peritonitis* "in a few days;" child lived and grew up. No. 7, black, 3 ft. 6, conjugate $1\frac{1}{2}$, in labour 50 hours, and much exhausted; child 6 pounds, and dead; woman died of *exhaustion* in 4 hours. No. 8, white, conjugate 1 inch, in labour 4 days; craniotomy attempted, and promontory of sacrum punctured in three places, through the walls of the rectum, in mistake for the foetal head; woman died in 6 days, from the *injury to the rectum*; child lived and thrived. No. 10 black, conjugate $1\frac{1}{4}$, time in labour not stated; child lived to age of 19; woman did well for 4 days, and was in a very fair way for recovery, when she threw herself into convulsions by a *dinner of dumplings*, causing her death in two hours. No. 11 white, 3 ft. 2, conjugate $1\frac{1}{4}$, in labour 42 hours, child 9 pounds, mother 70; craniotomy attempted, and persevered in for 3 hours, the woman becoming completely exhausted; died of *peritonitis* in $63\frac{1}{2}$ hours. No. 13 black, 3 ft. 9, five months pregnant; in labour nearly 2 days, brought on by an attack of dysentery, followed by peritonitis; woman had been operated on once before, and her child saved, after a labour of only $4\frac{1}{2}$ hours; she died in five days of the *pre-existing entero-peritonitis*. No. 15 white, in labour 3 days, two of them under the care of a midwife; craniotomy first performed by the operator, failing in which, he discovered the necessity for gastro-hysterotomy; woman died of *peritonitis* in 72 hours, as might have

reasonably been expected. *No.* 16 white, 3 ft., conjugate 3 inch., spinal deformity, breech presentation, operation on third day of labour, after failure in version and trial with the blunt hook; woman died of *exhaustion* in $51\frac{1}{2}$ hours; child saved. *No.* 17 white, Irish, scarcely 4 ft. high, conjugate $1\frac{1}{2}$; advised to have an abortion produced when about half gone in pregnancy, but declined; in labor, at term, 3 days under a midwife, who gave ergot freely; pulse 120 before operation; inertia of uterus, hemorrhage, no uterine sutures used; died in 8 hours; no autopsy; hemorrhage thought to have returned; child dead. *No.* 18 white, 3 ft. $11\frac{1}{2}$, stout, 115 pounds, conjugate $\frac{7}{8}$; woman under observation of two accoucheurs from 9th hour of labour, but not operated on until in labour 38 hours, and much exhausted; the membranes were unruptured. The woman was very fortunate to recover under the circumstances; the child also was saved. With such a conjugate there was no question as to the form of delivery, and much danger in the delay in operating. This woman was not only dwarfed, but her pelvis was nearly closed up by an exostosis growing from the sacrum.

It is a little remarkable that of 23 dwarfs operated upon by the Cæsarean section in North America, whose cases we have on record, 18 were whites, and only 5 blacks, although rachitic deformity of the pelvis has been quite prevalent among the slave population in some localities of the South, particularly in parts of Louisiana; still, not one of the 18 operations credited to that State was performed upon what would be properly classified as a dwarf woman. There have been 10 operations upon dwarfs reported from the former slave States, and 6 of them were upon white women. The record of Pennsylvania shows a majority of her Cæsarean subjects to have been rachitic dwarfs, or 5 out of 9 cases, with but one black; three of the four operations upon white dwarfs, by being performed early, were successful.

Our record of American Cæsarean operations upon dwarfs very clearly sets forth the value of early, and the risks of late, surgical delivery. A dwarf, being healthy, but inferior in powers of endurance, must have the advantages of an early, a very early, operation, if we expect to save her life; give her this, and she will, in the majority of instances, recover; exhaust her by delay, or a trial of impracticable expedients, and the record reads, "death by shock, exhaustion, peritonitis, or septicæmia." There is clearly an intimate connection between the condition of the patient at the time of the operation and the result; so much so, that by a record of the case up to the time of the incision, we can in a majority of instances give a correct conjecture as to the final result. *Dwarf No.* 12, now living, was operated upon in this State seventeen years ago, after a labour of only 2 hours, by the late Dr. Barnes, of Northampton County, and was already, in that short time, showing signs of becoming exhausted. What hope would there be in saving such a case even with but one day's delay? *Dwarf No.* 16, also of this State, was about the size of Dr. Mayer's case in Brest, already referred to, and might have been saved if delivered with the same promptness; but there were points of difference, which gave

a hope of delivery through the pelvis in the latter, until too late to secure success under the knife. This excuse could not be given for the delay in cases where, even Dr. Barnes, of London, would admit that the operation by the knife was alone practicable. There must be a vast amount of ignorance in the land to account for the culpable management of the great majority of cases of labour in women with deformed or impassable pelves.

Rachitic women generally belong to the lower walks of life; and, from their position, in the large majority of instances, engage as their attendant in labour, either a midwife, often of the lowest grade, or an accoucheur who has but a very imperfect knowledge of the higher obstetrics. These people are often a long time before they recognize the fact that there is something serious in the case, and even then it does not occur to them that perhaps delivery *per vias naturales* is utterly hopeless; so they wait and wait, until friends become anxious, and they request a consultation, send for an accoucheur, a surgeon, or both, and finally, perhaps, a dozen doctors. The accoucheurs consult, try various expedients, waste perhaps some more valuable time, and at last decide that there is no hope but in the Cæsarean operation, and the patient submits to the use of the knife to obtain rest from suffering, in a condition of exhaustion which is calculated to make it in a few hours or days the *rest of death*. And then there is a grand hue and cry about the dreadful danger of the Cæsarean operation, and it is denominated the "*forlorn hope*," "*the last resort*," "*the most dangerous operation in surgery*," etc. "There's nobody to blame; the surgeon was very skilful, and managed the after-treatment admirably; but then the operation is so dangerous that scarcely any one recovers from it." What does the operator say, and what have a number of such written to the author of this paper? "*The case was rendered hopeless by delay before I was called in; had I been summoned early, I have very little doubt but that the woman would have recovered.*" A careful surgeon knows the importance of having his patient in as good condition as his disease or injury will allow before he operates upon him. He is often weeks in preparing the case for the knife, because, by so doing, he hopes to save him from its effects. An operation is not to be measured by the mortality that follows it, for the gravity changes with the condition of the case. Tracheotomy is not a dangerous operation in itself, and yet death follows it much more frequently than gastro-hysterotomy, and so also is it the case with many other operations in surgery. The real question at issue is, what is the true rate of mortality after gastro-hysterotomy under the advantages which a careful management of the case is capable of affording it?

Cases of African Blood.—I cannot find any ground for believing that the question of race has had any special bearing upon the mortality which has followed the Cæsarean operation in the United States. At first it might appear that the blacks possessed an advantage over the whites in the proportion of recoveries to deaths; but a close observation shows that this has been due to conditions which are not dependent upon any ethnical

peculiarity. The promptness, care, and skill often exercised by French operators under the slave system, gave, in many cases, an advantage to the black over the less fortunate white; but, where the circumstances are similar, the results have varied but little in favor of either. 52 white women and 48 blacks compose the 100 cases; 18 whites and 26 blacks recovered, and 34 whites and 22 blacks died. One-half of the saved blacks were in Louisiana, and ten of the 34 whites who died were dwarfs. In the last ten years five blacks out of six operated upon died.

Mortality of the Children.—Of the whites, 25 children were born alive, of whom 5 soon died; and 27 were dead on delivery. 23 black children were removed alive; 3 died, and 25 were dead on delivery. There is in the profession a disposition to undervalue to a great degree the life of the fœtus as compared with that of the mother, and to sacrifice it for her benefit with very little hesitation; hence, the popularity of the cephalotribe, especially in Great Britain, where it is used in exceedingly contracted pelves. In many of the hundred cases the child was sacrificed to no purpose, and the case lost by the consequent delay and exhaustion. To save the child is often to save the mother, and, where the operation is timely, both are in the majority of cases preserved. If more regard was paid to the life of the fœtus there would be more promptness in deciding to operate, and many less deaths to record against the operation. In a letter recently received from Dr. Thomas Radford, of Manchester, England, he says: "The salvation of the infant is a principle of first importance in my mind. The present practice seems to be running into the line of a destructive character. Craniotomy and cephalotripsy. . . . The Cæsarean section should be considered an operation of election, and not one of necessity." Dr. Radford has twice operated, the first time thirty-five years ago, and has assisted in *four* other cases. He is the author of a work entitled "*Observations on the Cæsarean Section*," 1865, and a supplementary pamphlet, 1868, containing the records of 98 operations performed in his own country.

The cause of death of the fœtus from prolonged labour cannot be very satisfactorily determined, except in a few cases. We are obliged to attribute the deaths to uterine pressure as a general agent, but are forced to conjecture as to its method of application. We know that ergotic contractions, being more violent than those of a purely natural character, are very dangerous to the life of the child when seriously obstructed in its exit, and we infer that pressure is the element of danger, but cannot tell positively whether this is fatally exerted upon the brain, the bloodvessels of the body, or both. Where the fœtus lies transversely, and is bent laterally in the pelvis, death no doubt comes by obstructed circulation, aided perhaps by distortion of the spine and pressure upon the spinal nerves; but where the head presents, recent observers have attributed the death to pressure upon the cranium. One thing, however, is certain,

death takes place in some cases at an unaccountably early period, and in others life is preserved during several days of active uterine effort. If the placenta and cord are so placed that they escape pressure between the uterus and fœtus, and the fœtal ellipse be well maintained, the child be perfectly developed, and the head prevented from undue pressure upon a small surface, I see no reason why it should not live a long time, even after the amniotic fluid has, in a large measure, escaped. I know that children do live through very long labours, and believe this the most plausible method of accounting for their preservation.

Of the 52 children delivered dead, 24 had been subjected to prolonged uterine pressure during the delay in delivery, 8 were destroyed by instruments, 5 were transverse presentations, and impacted in or upon the pelvis, 5 died before labour came on, the gestation having been prolonged, 2 were lost by prolapsus of the funis, 1 by ergotic contractions, 1 by convulsions in the mother, 2 were premature, and in 4 the cause was not mentioned or anything definitely given by which death could be accounted for. This degree of mortality is much greater than that of Great Britain, where 56 children were saved out of 98, although but 16 of the mothers recovered. Contrast the mortality of the fœtus in our 100 operations with the number lost in the cases operated upon on the first day of labour, and we find a vast proportionate difference in favour of the latter. 24 women are known to have been delivered on the first day of labour; and there are reasons for believing that 6 others should be added to this list. Of the 30 children delivered from these women, 27 were alive, of whom 3 soon died, and 3 were dead on removal. Thus we have 30 operations saving 24 children, against 70 by which but 16 were saved, showing the great importance to the fœtus of an early operation.

Mortality of the Women.—Although it is by no means fair to charge the losses under the Cæsarean section to the operation, when in so many cases it was resorted to after the condition of the patient rendered it hopeless, it is of interest to know that notwithstanding the numerous instances of bad management, 44 women were saved, or four more than the number of children. What the proportion might have been we can estimate, by selecting *those who were in a favourable condition* at the time of the operation, and had not been more than a reasonable period in labour, but one of them as long as twenty-four hours. Of this class of cases I find but 24 in which the points mentioned are particularly noted, and out of this number 6 were lost and 18 saved, or 75 per cent.; all of the children being alive but 2, and 19 being saved, or $79\frac{1}{6}$ per cent. I was satisfied several years ago that this operation, performed under circumstances of time, health, and conditions calculated to favour it, ought to save in our country from 65 to 75 per cent. of the women and children, and, although I have nearly doubled the collection of cases since, and largely increased

the proportion of deaths in the whole number, I still find my original estimate of promptly relieved cases to be correct.

Causes of Death in the Women.—We frequently hear of the great danger of death by *hemorrhage* under the Caesarean operation; but this is a great error. There is an indirect danger from this source, but it does not arise from the amount of loss, but from the poison generated by the decomposition of, it may be, quite a small portion of escaped blood in the abdominal cavity. This is one of the dangers of a late operation, and seldom follows, when it is done early, for the simple reason that an exhausted uterus does not as a general rule contract well, or if it does, maintain the contracted condition so as to keep the uterine wound tightly closed. There is danger from hemorrhage in the operation, provided the uterus does not contract promptly after the fetus has been removed, and especially in cases where the placenta is in the line of the incision, or the obstruction to delivery lies in a large uterine fibroid; but this accident of delivery has a remedy in ergot previously administered, in uterine palpation, the introduction of ice into the uterus, or in the failure of these, the closure of the uterine wound by silver wire sutures. In the 56 per cent. of deaths there are but four cases in which hemorrhage is recorded as a special element: of these two were affected with fibroid tumours; one in a crippled dwarf, and the other in a case of prolonged gestation, bearing a putrid fetus, and having no distinct labour pains. The third was almost pulseless when operated upon, and had been in labour four days; and the fourth was under a midwife for three days, and dosed with ergot. There may have been some secondary concealed hemorrhage in some of the cases recorded as having died of exhaustion, but in most of these women there was a condition of extreme prostration prior to the operation.

The term *exhaustion* is a convenient one for the cause of death, and a correct one in many instances, but a very unsatisfactory one in others, especially where the woman has survived the operation several days. 15 deaths are attributed to this cause, all in cases of prolonged labour, the time varying from 26 hours to 15 days. 7 died within seventeen hours; 4 on the second day; 2 on the third; 1 on the fourth, and 1 on the sixth. I believe that an element of septic poisoning exists in some of the later cases of apparent "shock and exhaustion." A woman is prostrated by a long labour, and is operated upon in this condition; if she does not fall a victim to the shock to the nervous system, in a few hours, she will perhaps rally a little, remain weak and almost pulseless a day or two and then die. She may die simply of the exhaustion and shock; but make an autopsy, and you will find pathological changes in the uterus and abdominal cavity that indicate other complications; the uterine wound is open, and it may be slightly gangrenous; there is at least little or no attempt at union; there is a bloody fluid in the abdomen, it may be in very small amount, and there are evidences to the eye of a congestion or slight inflammation of the

peritoneum; the heart also, if opened, will perhaps present a fibrinous clot of recent formation, indicative rather of the method of death than of any real cardiac disease. To avoid this condition, there is only one remedy, *operate early*. Look at the timely cases in our American record, and imitate the promptness with which they were undertaken. Why were Prevost, Gibson, Hoffman, Scudlay, Mills, and others so successful? because of the fact that their patients were in labour but a few hours before relieved of exhausting suffering.

Peritonitis is the great dread of the abdominal operator, although gynaecologists are becoming much less afraid of exciting it than in former years. It is certainly much to be feared in gastro-hysterotomy, and will make its appearance even where the condition of the patient was favourable at the time of the operation. But there is this consolation, it may be avoided in large measure by an early resort to the knife whilst the patient is still strong, and the uterine contractions active. It is a form of inflammation that finds its home in exhaustion, being of the adynamic type in many subjects, like its near relative, erysipelas. Eighteen operations resulted in peritonitis and death, only four of the women having been in labour less than a day; the other fourteen varying from a little more than twenty-four hours to nearly four days. But one of the four cases in women operated upon early, presents no assignable reason for the attack. No. 18 of my case-book was a dwarf of 3 feet 6, and exhausted before the operation. No. 94 was but 3 feet 4. No. 61 was in delicate health, and had also her ovaries removed in the operation. But No. 41 was in good condition, had a timely operation, and still fell a victim to peritoneal inflammation in a little over four days.

There is certainly a very marked connection between a long delay before the Caesarean section is made, and a peritonitis as an after result. There are exceptions both ways, a prolonged case escaping, and an early one being attacked; but the general rule favours the timely operation. We can readily see how an exhausted patient would die of shock and exhaustion after an operation of so grave a character, but how prostration of system favours an attack of peritonitis we cannot so readily comprehend. We have seen repeated attacks of erysipelas follow a wound in an enfeebled subject (in one case seven times), and as the two forms of inflammation very nearly resemble each other, we infer that debility favours the approach of either. Another element that enters into the production of peritonitis is the sensitive condition of the uterus after a long labour to traumatic inflammation when incised. As a confused muscle is not a good one out of which to make a flap in an amputation, so the uterus, when affected by pressure upon a resisting fetus, is not in a safe condition to incise, as such an interference may bring on metritis, metro-peritonitis, phlebitis, or septicæmia. In early labour there seems to be much less risk.

It will be profitable to note the conditions of 13 women, prior to the ope-

ration, who afterwards fell victims to peritonitis, viz. : No. 9 exhausted by an attempt to deliver by craniotomy. No. 13, in labour $3\frac{1}{2}$ days under a midwife—exhausted and feverish. No. 14, in labour 2 days under a midwife, imprudently got out of bed on 5th day—died on 8th. Nos. 21, 23, 24, 55, 73, 80, 81, and 87, all protracted labours. Nos. 50 and 84, both long labours, with craniotomy ; 84, two days under a midwife, and one additional under an accoucheur. Two women died on the second day, six on the third, two on the fourth, one on the fifth, one on the eighth, and one on the tenth. The one who rose too soon was not attacked until the fifth day after the operation.

Septicæmia, as a cause of death, is reported in only two instances, which I believe to be far from the truth, although unintentionally a misstatement. A woman, after a culpably long labour, with perhaps a failure in craniotomy or version, endures *in extremis*, or near it, the Cæsarean section. She is relieved by the removal of the fetus ; rallies somewhat ; lives a few days in a weak condition ; has some peritoneal symptoms, and dies. One observer calls it a death from shock, another exhaustion, a third peritonitis, and a fourth septicæmia, when perhaps, as is the case in the large majority of instances, no autopsy was permitted to be made. What is the real cause of death ? We open the body of a woman, and find scarcely a sign of peritonitis, at least apparently not enough to occasion her death ; but the uterine wound is open, its edges are unhealthy, there are evidences of slight gangrene in them, and perhaps pus escapes under pressure ; there is also more or less blood in a state of commencing or advanced decomposition in the abdominal cavity ; and an unhealthy-looking matter in the cavity of the uterus. Here are exciting causes enough for septic poisoning. Did the woman die of it ? The microscope, and a careful minute examination of the uterus, and a few remote organs and their vessels, must determine this. If the blood found, or the escaped uterine discharges, are the *fons et origo* of the condition that has led to death, then how important to secure the uterine wound by sutures, and establish a proper drainage *per ragnum* to prevent such a mishap. If the uterus will contract sufficiently well in the early hours of labour to avoid this necessity, then how much better to operate in good season and obtain this advantage. Inflammation which has no element of septic poisoning, is not necessarily fatal, and a patient may recover even when the attack has ended in the formation of an abscess, as in case 22, where the patient had been in labour only a few hours. In a second operation the recovery was without any special element of danger. Inflammatory sequelæ are not uncommon in cases of early operation, but they are of a more healthy type than after late ones, and much more seldom end in death. Evidences of local peritonitis ending in the formation of adhesions have been discovered on several occasions under second operations, where the symptoms of the peritoneal implication were not all pronounced at the time of the attack.

Previous disease may so weaken the body and impair the health, as to render the Casarean operation much more than usually serious. In Europe, the usual depressing malady is mollities ossium, which we fortunately have not to contend with in the United States. Here, what is most common, is a delicate, deformed frame, the effect of rachitic growth in childhood, leaving the woman with a depressed power of endurance. Albuminuria—fibroid growths in the uterus—coxalgia—dysentery—intermittent fever—and prolonged gestation from occlusion of uterus, are recorded as existing in patients prior to operation in the United States. Of six cases of fibrous tumour, four intra-uterine, and two pelvic, all died but one of the latter, who had also intermittent fever: she was operated on when in labour fourteen hours. Of four cases of *eclampsia*, all died but one, which was not uræmic; children were all lost. There were three cases of *prolonged gestation*, one of about forty-four months, one twenty-one or twenty-two, and one several weeks over time. In all, the fetus was purrid, and the patients in bad health. In two there had been local peritonitis, and the adhesions enabled the operator to open the uterus without exposing the abdominal cavity—these women recovered; the third brought on peritonitis by folly in eating, about the tenth day, and died. All had inflammatory occlusion of the os uteri. It is a question whether these women might not have been operated upon by hysterotomy,¹ as this operation has proved successful even where there was no appearance of an os discoverable: the section can be made under eye by the aid of a speculum. Fibroid tumours are not necessarily a fatal complication in gastro-hysterotomy, although no woman with such an obstacle to delivery within her uterus has survived the operation in the United States. If the tumour should be seated low down in the posterior part of the organ, and the operation be performed early, the hemorrhage ought to be controllable by wire sutures, and the patient saved. Dr. Cazin,² of Boulogne, France, operated in a case in 1874, on the fourth day of labour, and although there was inertia of the uterus, and the woman fainted from the hemorrhage, he was enabled to arrest it entirely by five uterine sutures of silver wire, and both mother and child survived. After the operation the fibroid commenced to diminish in size.

Uterine sutures have been employed in fifteen cases of Casarean section in the United States (see account of cases in this *Journal* for April, page 326). In a letter recently received from Dr. James Parrish, of Portsmouth, Virginia, reporting a case which he believed to have died from hemorrhage, he remarks: "My decision not to use uterine sutures was mainly determined by the very decided attitude of Cazeau upon this point. Yet that it is very bad practice, indeed, I have now no manner of doubt."

¹ See two cases of this operation on same woman, with success to her and the children, by Mr. Alexander Tweedie, in *Guy's Hospital Reports*, vol. ii. p. 258.

² Archives de Tocologie, vol. i. 1874, p. 704.

The woman had been in labour under care of a midwife for three days, and ergot freely administered—hemorrhage was quite free from the uterine incision, and difficult to arrest, as the uterus was slow in contracting—ice was used with effect, but it was thought that the uterus must have relaxed after the abdomen was closed, as the patient sank, and died in eight hours. Similar cases have been saved by the silver-wire suture. In no *timely* operation except in one instance were sutures required, and in this one, the knife had cut through an intra-mural fibroid, which caused the wound to gape open.

Antiseptic Treatment.—This includes a variety of expedients to prevent blood-poisoning. 1. Sponging out the cavity of the abdomen, and in cases where the fetus has been putrid, the uterus also. 2. Drainage through the vagina, abdominal wound, or both, by Chassaignac's tubes, or Winckel's *mèche*, and the use of the syringe to wash out the discharges. 3. Keeping open the lower part of the abdominal wound for inspection, and escape of noxious fluids. 4. The use of Lister's dressing to the abdominal wound. 5. The employment of the irrigator to the abdomen, to keep down the temperature of the body; this saved a very unpromising case at the hands of Dr. Fowler, of Alabama, in 1866, after a labour of sixty hours (see case 52, April number), the patient being not only exhausted, but anæmic from loss of blood. 6. The re-opening of the abdominal incision for the removal of escaped uterine discharge, or purulent accumulation, and syringing out the cavity containing it: this was done in 1827, by Dr. Richmond, of Ohio, who thereby saved his patient (case 2, April number).

Cæsarean Operations Increasing in Fatality in the United States.—Instead of progressing toward success in latter years, as all the other varieties of abdominal surgery have been, we have been most decidedly retrograding, under the instruction of those who teach that gastro-hysterotomy is to be regarded as the "last resort," and never an operation of election, if there is a possibility of delivery by cephalotripsy, even although it may rightly be considered equally dangerous to the mother. This leads to experiments, failures, loss of time, and a delay that is very often fatal. To demonstrate the fact of retrogression, I have divided the last forty years into its four decades, and present the following as their respective records, viz.:—From 1838 inclusive, to 1848—8 operations—4 women recovered, 4 died, 5 children delivered alive, 3 *timely operations*. . . . 1848 to 1858—27 operations—13 women recovered, 14 died, 15 children delivered alive, 8 *timely operations*. . . . 1858 to 1868—23 operations—13 women recovered, 10 died, 8 children delivered alive, 5 *timely operations*; 8 cases with no deformity of pelvis recovered, four being cases of impaction of the fetus in the transverse position; two, vaginal occlusion; one, impaction of the rectum with clay; and one, impaction of foetal head in the pelvis, a very unjustifiable operation. This accounts for

the greater mortality in the children. . . . 1868 to 1878—27 operations—4 women recovered and 23 died, 13 children delivered alive and 14 dead, *timely operations* 5; remainder, 2, 3, 1, 7, and 15 days in labour, there being three of the last. The manner of death as recorded, is indicative of the effect of long delay, *i. e.*, peritonitis 8, exhaustion 8, hemorrhage and exhaustion 2, septicæmia 2, etc. Here we have again the evidences of the importance of an early resort to the knife, its value in saving life; and the danger of a long labour in making recovery almost impossible. View the subject in all its aspects, and we find that it leads us to the same point. There is a fair prospect of saving both mother and child by an operation during the first hours of labour, and this hope diminishes as labour advances, until there is a marked falling off; and, finally, the prognosis becomes exceedingly unfavourable, as very few escape. Until these facts become generally known to the midwives and obstetricians of the United States, we may still expect them to act in the same way as they have so long done. The ignorance displayed in managing the cases during the last ten years, and their frightful mortality, are both discouraging and appalling. It is also disheartening to find that 10 of the worst cases of delay ending in death, were under treatment in cities, in several of which are medical schools. Eight were cases of deformed pelvis, and two of exostosis. They were in labour from two to four days or more—two were two days, five were three days, one was four days, one was "several days," and one "exhausted by long labour." How many of the twenty-three women whose cases were fatal during the last ten years were first under the care of a midwife, I am not able to say: in five, the fact that they had been, is mentioned, but it is fair to presume that the delay commenced with them in quite a number.

Hospital Cases.—As yet, but two operations have been performed in the hospitals of the United States, and both cases died because of delay. There is no reason why cases might not do well in hospitals; and it is a pity that the poor and ignorant could not have the benefit of hospital skill from the moment of falling in labour, and thus escape the dangers of malpractice under stupid midwives. The experience of Paris is not in favour of hospitals, as they have not been successful in that city, for reasons, one of which will be learned by the following report of Dr. M. M. Rogers to the *Buffalo Med. Journ.*, in June, 1851:—

In January, 1851, a rickety dwarf of 24 years of age was taken in labour at the Hospital Clinique des Accouchemens, of Paris, the waters soon broke, and after a labour of six hours, finding a conjugate of 14, the chief called in the late Baron Paul Dubois, who with Prof. De Paul consulted upon the case, and decided that the Cæsarean operation must be performed. The woman by this time (9 P. M.) was becoming exhausted; her child was living, and she required as early relief as possible; but instead of operating at once, they postponed doing it until 10 A. M., when it took place with due skill and quickness in the amphitheatre before the class. By this time (nineteen hours labour) the child had perished, and

the woman was much exhausted. She sunk after the operation, to die of collapse in 36 hours. .

In the April number of this Journal I related an exactly similar case for the same hospital, that ended in the same way; the consultants being Drs. Cazeau and Moreau, and the latter the operator. The operation took place in 1837, and had been postponed over twenty hours, making the labour 36 hours—death in same way, but much sooner. The women and children were lost, but then the class saw two beautiful operations. As I have no fear of our surgeons sacrificing humanity to science in this way, this hospital objection is not any obstacle to success here. The difficulty lies in securing the patient in time, whether for private or hospital treatment.

Induction of Premature Labour, as a Method of Escape from the necessity of Performing Gastro-hysterotomy.—This is a very beautiful plan in theory, but not at all easy to put into practice. There are many women of the better class who may be so contracted in the pelvis as not to be able to bear a living child at term, and yet who are far from requiring that the Casarean operation should be performed. To such women, the saving of a living child by an artificially excited labour, at an early period, consistent with viability, is a great blessing; and the proposition to perform the operation, is one that appeals to their sense of reason, and is often responded to accordingly. But the subjects of infantile rickets are usually of a different class, and much less likely to be properly impressed when appealed to in adult life after they have become pregnant. Besides, in many cases it would be impossible to remove a viable fetus because of the excessive deformity, a space of $2\frac{1}{2}$ inches conjugate being required, according to Kiwisch, for one of the 30th week to pass through. In several instances the attempt has been made to induce deformed women to submit to an abortion, and they have almost uniformly declined, and this has been done even after they have on a former occasion been obliged to endure the risk and suffering of the Casarean section. I will illustrate these facts by two examples. In June, 1877, Prof. Edward W. Jenks, of Detroit, delivered a German woman of 24, by the Casarean operation, after a labour of 7 days, during which time she had been in the hands of a party of women, assisted finally by a midwife. The woman had a deformed pelvis, and the child's arm protruded; she made a very remarkable recovery. Last spring she was pregnant again, and Dr. Jenks, in order to avoid the risk of a second operation, tried to persuade her and her husband to let him bring on labour prematurely, but to no purpose. They were both stupid and ignorant—the husband did not want "to have the baby disturbed"—and the wife said she would run all risks. Fortunately the fetus died, became putrid, and she aborted. . . . In May, 1875, Dr. James Parrish, of Portsmouth, Virginia, was consulted by an Irish primipara, scarcely 4 feet high, deformed, having a conjugate of $1\frac{1}{2}$ inch, and about half advanced

in pregnancy, as to the possibility of her being delivered at term; and he advised the immediate production of abortion, which she declined from religious scruples. In September she placed herself under the care of a midwife for delivery, ergot was freely given, and after three days' trial Dr. Parrish was sent for. She survived the Cæsarean operation eight hours. If we could give such people the requisite degree of intelligence, we might hope to be able to induce them to submit, by demonstrating the abnormal anatomy of their pelvis; but the words would be as an idle tale, as they evidently were to these two white women of foreign birth. Other instances of a declination of a similar character might be mentioned.

What is a Timely Cæsarean Operation?—The record of cases examined clearly establishes the fact, that a section to be in season to save both mother and child should be early. If a dwarf begins to show signs of exhaustion after labour of from two to six hours, then her operation should take place, according to this measure of time, if the labour is active; it may be as late as ten or twelve hours, if she is strong and has a good pulse. When the os uteri is sufficiently opened for drainage, the case may be operated upon. As a general rule, the earlier the operation, the more likely is the patient to recover. Women who have not had rickets and are well grown and robust, can bear with safety a much longer delay, as shown in the results of operations for impacted fetus. I thought at one time that an operation within the first day of labour should be esteemed early; but the reports of cases of women exhausted within this period, have caused me to alter my views.

Operations of Election.—Great as are the admitted dangers of craniotomy, cephalotripsy, and embryulcia, to the mother, there are those who appear to hold to the opinion, that we should never make choice of the Cæsarean operation, if the fetus can by any possibility be delivered *per vias naturales*. We have had women in the United States who endured several hours of suffering under craniotomy, and narrowly escaped with their lives, who were afterwards delivered safely of living children by gastro-hysterotomy. In 15 of the 100 cases reported, the operation was predetermined on account of former, or anticipated difficulties, and the same arranged for, by the operator. In 13, the women recovered, and all of the children were delivered alive but one, the child presenting by the arm. In five instances the Cæsarean operation succeeded a former delivery by embryulcia, as an operation of election, and all the women and children were saved. Dr. W. S. Playfair says, in his treatise on Midwifery:¹ "Great as are the dangers attending craniotomy in extreme difficulty, there can be no doubt that we must perform it whenever it is practicable, and only resort to the Cæsarean section when no other means of delivery are possible." This is the generally accepted doctrine of the English school of obstetrics of the present day, although Radford, Green-

¹ Science and Practice of Midwifery, American edition, 1878, p. 502.

halgh, and a few others are opposed to it. Denman and Meigs questioned the propriety of repeatedly performing craniotomy in the same woman, and the latter was one of the first to act upon it in the United States, when he refused thus to deliver Mrs. Reybold in her third labour.

Dr. Playfair says, "he would be a bold man who would deliberately elect to perform the Cæsarean section on such grounds;" and I am happy to answer, that we have had several such bold men, and that they were repaid in a remarkable manner by success. What better trophy could Dr. Meigs, if now living, present, than Mrs. Reybold, with her two children and six grandchildren, as the fruits of his declining, in 1835, to destroy any more children for her? There can be no question now, but that Mrs. R. not only suffered far more in the two craniotomies, and was in more danger afterwards, than from the two operations of Prof. Gibson.

In view of American success in cases of election, we must object to the opinion of Dr. Playfair being applied to American subjects. We do not claim that they are in any greater danger from craniotomy than English women, but do, that by reason of climate and condition, the Cæsarean section is much more promising of success when seasonably made, than in Great Britain. We must claim the privilege of election where we find a deformed pelvis having a conjugate diameter of $2\frac{1}{4}$, and in some cases of $2\frac{1}{2}$ inches, where there has been no opportunity in the proper season for delivery by induced labour. The late Dr. Parry, after having been nearly seven hours in delivering a woman by craniotomy, who had been thus delivered before, and who narrowly escaped death from peritonitis after his operation, told me that he had determined in case of her being again pregnant, to perform the Cæsarean operation, as more simple, less dangerous, and possessing in addition the important advantage of preserving the child. He unfortunately did not live to put his opinion in practice, and possibly might not have had the opportunity, as the woman in her next labour did not call in competent advice until too late; she was operated upon by craniotomy, and died of blood-poisoning.

Laparo-Elytrotomy.—Although Dr. Thomas did not originate the sub-peritoneal substitute for gastro-hysterotomy, the credit of opening the vagina by laceration to avoid hemorrhage belongs to him. He would have us believe that this mode of delivery is infinitely safer than the Cæsarean section, which, for one, I am not at all inclined to credit. I admit that it would appear to be much safer in cases of prolonged labour, in which it is dangerous to incise the uterus; but do not believe that it will prove to be any less dangerous than the Cæsarean operation performed as it should be, early on the first day of labour. Gastro-hysterotomy is an operation of a very duplex character; as a timely method of delivery, it has a mortality of 25 to 30 per cent.; and as one of "the last resort," the deaths very far outnumber the recoveries, having been six to one in New York City. The record of the last ten years shows that Dr. Thomas's

substitute is a much needed one in many of our large cities, where the poor deformed victims of rickets are so apt to begin their labours in charge of some ignorant midwife or third-rate accoucheur. In such cases we should recommend Dr. Thomas's operation, so as to avoid the risk of opening the uterus by incision. This operation will no doubt be tested at home and abroad in a few years, and we can then learn its relative safety when brought into comparison with the Casarean section performed in the early hours of labor. If rickety women will go to ignorant midwives, then we should give them the advantage of Dr. Thomas's improvement on Ritgen's operation.

From the way in which statistics have been drawn up, by grouping all the cases together, and then taking the general average, the Casarean operation is credited with a mortality of 56 per cent., or thereabouts, as with us in the record presented. But this by no means represents the danger of the operation *per se*, as shown by a series of properly conducted cases, many of the balance being either exhausted, *in extremis*, or moribund at the time of the operation, as stated by their reporters. Dr. Playfair, in his *Midwifery*, very justly remarks: "Until we are in possession of a sufficient number of cases performed under conditions showing that the result is obviously due to the operation, in which it was undertaken at an early period of labour, and performed with a reasonable amount of care, it is obviously impossible to arrive at any reliable conclusions as to the mortality of the operation." Kayser estimates the mortality from second operations on the same women at 29 per cent.; in the United States it has been 25, or 2 women lost out of 8. The two lost were both in bad health, and one almost hopelessly diseased; hence their death. One-fifth of the operations in the United States were performed after from 2 to 15 hours of labour, and 3 out of 4 women were saved (15 out of 20), with 18 children.

Records according to States.—Louisiana presents several cases prior to the operation having been done in any other State. Her oldest living operator is Dr. Thomas Cottman, who has twice made the section with success, the first in 1832. Ohio stands second on the list, her first case a success, in 1827; Virginia is the third in order, in 1828; next Pennsylvania, in 1832, the operator, Dr. James S. Dougal, having lived until a few months ago; then Tennessee, in 1837, the operator, Dr. John Travis, I believe, being still alive; then New York, in 1838, operator, Dr. Richard K. Hoffman, etc. *Louisiana* presents probably the most remarkable record of any country, 18 operations, 14 women and 10 children saved. Half of the cases had never been published. 3 women were operated upon twice, and all recovered, five of the children being delivered living. *New York* comes next in numbers; 13, but a great contrast to Louisiana—11 women lost, and 9 children; nearly all the women exhausted, or *in extremis*, before the operation. *Pennsylvania* has had 9 cases, with 4

recoveries, and 5 children saved. Four cases were dwarfs, three saved. *Alabama* has the same number as *Pennsylvania*, viz., 9, the oldest case (1848) having been received last, and quite recently; operator, the late Dr. William M. Boling, of Montgomery. Women, 8 black and 1 white; 6 blacks died, and the white woman recovered; 3 children delivered alive, and one soon died. Not a very flattering record for the ethical theory, in favor of the African race being better subjects than the white for this operation. Compare with *Ohio*—8 women operated upon, all whites, two of them small dwarfs, 6 recovered, and 5 children delivered alive. *Virginia* reports 7 operations—5 blacks, one lived—2 whites, one lived; 3 children delivered alive. *Mississippi* presents a record of six cases, three operations on the same woman, who died after the third; all the others died; no whites operated on; 6 children delivered alive, and one dead; one had twins living, an extra-uterine, and intra-uterine foetus. As an offset against this record, *Indiana* reports six operations, on five whites and one black; of whom only the black and one white recovered. Two children were saved, whose mothers died, and the balance were lost.

Of the remaining States, Michigan and Missouri have each had 3 cases; Arkansas, California, Connecticut, North Carolina, and Wisconsin, each 2; Georgia, Iowa, Kentucky, Maine, Maryland, Massachusetts, Tennessee, and South Carolina, each 1.

Concluding remarks.—I think it will be admitted that I have made a critical analysis of the one hundred cases, such as they were reported. Had they been perfectly presented to me in all points, I could have been more decided in some of my calculations, but there were deficiencies here and there which could not be filled up, although many in the published cases were supplied by correspondence. I should like to have had the age of every case, the exact time in labour, the pulse and temperature before the operation, and after it, etc.; but there were many gaps or unsatisfactory statements, although nothing very vital was omitted. The colour of the woman, and result to her and child after the operation, were always directly or indirectly reported. A want of definiteness is too common in such records, “a few hours,” “long and tedious,” and “several days” being used instead of exact numbers, which would be much more satisfactory when life often depends upon a measure of time.

My attention was attracted some years ago to the study of the Casarean operation in our own country, by the remarkably favourable results that had followed in some cases with which I was familiar, and the directly opposite termination of the section in others. This led to the examination of the causes of this difference, and the formation of an opinion which has grown stronger by investigation, and has stood the test of a careful examination of the whole American record. My researches taught me that we were greatly in error in the United States in the management of cases of extreme pelvic deformity; were too much afraid of the Casarean section;

followed too much the teachings of English obstetrical books, whose opinions are based upon the statistics of Great Britain; added largely to the fatality of the operation by delay; and did not regard or know the value of the instruction to be derived from the records of a number of timely and successful operations that had been performed in our own land. It is very natural that I should wish these facts to be disseminated, as we are dealing with a humane subject, and many lives may in future depend upon the truth being known, as to the relative value to the mother and child, of a *very early*, a *moderately late*, and a *very late* Casarean operation.

A very early operation in the United States will save about three out of four women, and as many children; a moderately late one will lose about two out of three women, and one-half of the children (this calculation is based upon the results of the cases of 15 women, who were in labour from 18 to 44 hours); and a very late operation, that is from two to fifteen days or more, after the commencement of labour, will lose three, four, or five to one, according to circumstances. Judging from the fact that delays are unaccountably made by accoucheurs, in cases where the operation would seem to be inevitable, we must, if charitable, believe that they cannot know the value that even an hour lost may be to the woman and child.

Dr. Thomas Radford was kind enough to send me several years ago his records of the Casarean operation in Great Britain and Ireland, which I have a number of times examined, but never so critically as of late. These show a very mysterious difference in relative mortality as compared with our own work. There were 20 operations in cases where the labour lasted from 5 to 18 hours, and but 4 women were saved, although but 4 children were lost. In the United States we should expect to save from 60 to 70 per cent. of both. In these twenty, we find three cases of rickets, nine of mollities ossium, two of exostosis of sacrum, two of epithelioma of the cervix, one of cancer of the rectum, one of fibrous tumour of the pelvis, and one of medullary tumour. The two women with exostosis recovered, and also one having mollities ossium, and one epithelioma of the cervix.

There is something marvellous about this rate of mortality in *timely* British operations, as the advantage is but a small percentage over the general run of cases, or as one death in five women to one in $6\frac{2}{3}$. By extending the limit of time in labour to twenty-four hours, I find in the same tables 25 operations, with 6 women and 19 children saved, an equivalent of 24 and 76 per cent. as compared with 16 and 57 in the general average. With twenty-five operations under the twenty-four hour limit in our country, we should expect to save from 50 to 60 per cent. of both mothers and children. So it will be seen that the results of gastro-hysterotomy are quite different in the two countries. We often hear the mortality of the operation in England attributed to delay, which we see is justly chargeable with only a fractional difference. If all the operations in the two

countries were to take place during the first twelve hours of labour, I should expect the result to show less than five women saved in Great Britain for ten in the United States, and the proportion of children to be about the same, or 75 to 80 per cent. in each country.

What makes this difference? We cannot account for it, as I have shown, by delay. We might attribute it to the existence and prevalence of *mollities ossium* as a cause of difficulty, but for the fact that cases of rickets do not seem to have done any better, and that one-fourth of the saved women were affected with cancer. It cannot, then, be, except, perhaps to a very small degree, dependent upon differences of disease. But three causes remain: 1. Difference of skill; we claim nothing here. 2. Difference of climate; we have certainly the advantage of dryness. 3. Difference of habits; here is probably one great basis of advantage, for we have no beer-drinking female peasantry, as in England, to be the subjects of the operation. But then again look at the results in ovariectomy under Spencer Wells, Keith, etc., which are not inferior to our own. This may perhaps be accounted for on the differences of social position between the great majority of the subjects of the two operations, the Casarean operation being almost entirely confined to women of the lowest classes, who, by poverty of living, have become the subjects of deformity of the pelvis, either in childhood or adult life. Dampness of climate, extreme poverty, and beer-drinking appear, then, to be the only assignable causes for the difference of results to the women of the two countries.

The opinion of London obstetricians, based upon the results of their Casarean cases, is decidedly hostile to and condemnatory of the operation, and is highly in favour of the cephalotribe, which is not to be wondered at, for under similar circumstances we should be tempted to hold the same views. The few who are in opposition are inclined to condemn the use of the cephalotribe as dangerous, and to defend the Casarean operation because it generally saves the child, who is entitled to its life; and although not favourable to the life of the mother, does save a small fractional percentage, which care and promptness might increase under favourable hygienic treatment and the avoidance of stimulants.

The Operation.—Although I shall not attempt to describe the steps of the operation, there are points to which it may be well to call special attention, in view of the teachings of the past.

1. The nearer the abdominal incision is made to the central line of the *linea alba*, the less will be the hemorrhage.

2. The earlier the operation, the better for the safety of the mother and child.

3. Chloroform, by leading to uterine inertia, and vomiting, is an unsafe anæsthetic. Local anæsthesia by spraying the line to be incised is safer.

4. The best sulphuric ether is a safer anæsthetic than chloroform.

5. In the days before the use of anæsthetics, the Cæsarean operation was safer than now, as there were no secondary anæsthetic effects.

6. The operation is not very painful after the skin has been incised; this is painful, and feels like burning with a hot wire. The stitching is the most severe.

7. To arrest uterine hemorrhage and prevent its return, suture the uterus with silver wire stitches.

8. Ice is a good remedy for exciting uterine contraction, and much safer than the persulphate or perchloride of iron. Vinegar is also a valuable excitant, and acts promptly. Ergot is a good preparative to avoid inertia.

9. The abdomen should be thoroughly cleared of all the blood and amniotic fluid which have escaped from the uterus during the operation.

10. Septic poisoning is apt to originate in the decomposition of matters that have escaped from the uterus, even when in small quantity.

11. Many women lose their lives through post-partum uterine relaxation ending in hemorrhage. To avoid this, operate very early and without anæsthesia. In all late cases, suture the uterus with silver wire for safety.

12. Where the uterine drainage is not good, leave the lower part of the abdominal wound open, and syringe out the abdominal cavity with dilute liq. sodæ chlorinat. f ʒij to Oj, or bromo-chloralum one part to forty or fifty of warm water, daily.

13. Never use catgut for uterine sutures; as the knots become untied, the wound opens, and patient dies.

14. If the temperature of the room is high, the wound may be kept open until the uterus is safely contracted, all bleeding arrested, and parts cleansed. In one case the wound was not closed for an hour, and the patient recovered.

15. If the fetus is dead and putrid, sponge out the uterus carefully and put five or six sutures in it. It is safer to do this than run the risk of secondary hemorrhage or escape of lochia into the peritoneal cavity. Two women, seven and ten days in labour, were thus saved in the United States, and are now alive and well.

